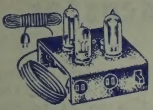
KNIGHT Wireless BROADCASTN



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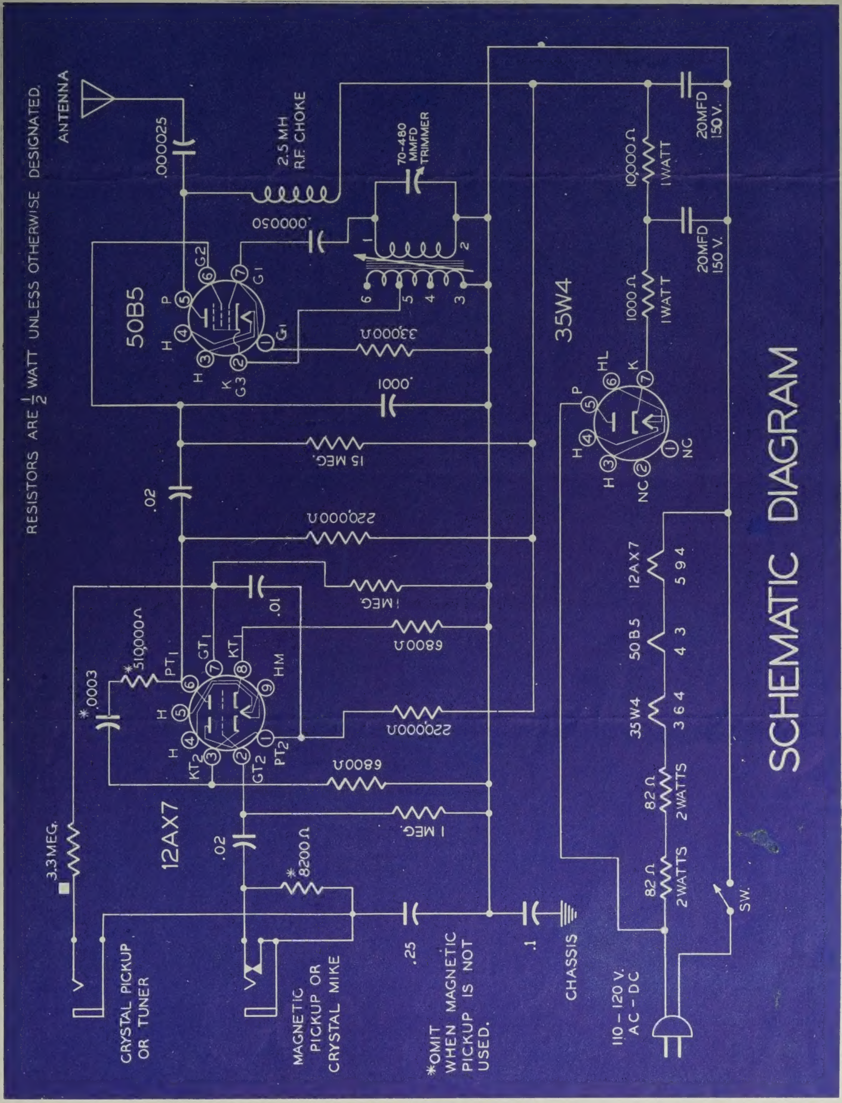
PROJECT

Knight "Wireless" Broadcaster



RESISTORS ARE $\frac{1}{2}$ WATT UNLESS OTHERWISE DESIGNATED.

*OMIT WHEN MAGNETIC PICKUP IS NOT USED.

SCHEMATIC DIAGRAM

5Y4

Building the KNIGHT Wireless Broadcaster

The KNIGHT Wireless Broadcaster permits the playing of phonograph records or the making of "radio" announcements through your radio set without the necessity of direct connection to the radio set itself. Either a crystal or new magnetic type of pickup may be used. It can be used at any distance up to 50 feet from your receiver. Power required is 110-120 volts, 60 cycle AC or 110-120 volts DC.

ASSEMBLY

A phono-oscillator is really a "miniature broadcast station" which may be operated legally because of its relatively low power and limited range. The unit described here is capable of 100% modulation, a feature not usually found in phono-oscillators. A compact, high quality unit, it is the product of careful design for both efficiency and economy.

The kit of parts is supplied complete down to the last screw, except for hook-up wire and solder. As the kit is unpacked, all parts should be checked against the parts list. Mount all components as shown in the pictorial diagram. The location of the parts has been carefully planned so that all leads will be short and direct, and the entire unit will be very compact. Resistors and paper condensers are supported by their own pigtail leads at the time of wiring.

Mount the tube sockets from the underside of the chassis. Be sure to mount the sockets in the same position as shown in the pictorial diagram. When the sockets are mounted in this manner all leads will be short. A careful examination of the sockets will show that the terminals of the sockets are numbered with the same numbers as shown on the pictorial diagram. The 9-pin miniature socket is provided with four ground lugs which are not required. They may be cut off or bent down so they will not interfere with the wiring.

When mounting the two jacks, care should be taken to be sure that the jack is properly insulated from the chassis. Two fiber insulating washers are provided for this purpose. The fiber washer with the raised ring in the center should first be placed over the threaded portion of the jack with the raised ring facing outward. The jack is then placed in the proper hole so that the ring on the washer fits inside the hole in the chassis. Next place the flat washer over the jack after which the metal wahser and nut may be installed. The closed circuit jack has three solder terminals and the open circuit jack has two solder terminals. Next mount the slide switch making sure that the switch may be easily turned on and off after the mounting bolts have been tightened. The five terminal mounting strip and filter condenser should be mounted next.

The oscillator coil should now be mounted through the proper hole in the chassis by means of the mounting nut furnished with the coil. The iron core adjustment screw should be set so that the top of the screw is from 3/8" to 1/2" above the chassis. When handling the oscillator coil and wiring the oscillator care should be taken so as to not damage the fine wires on the coil.

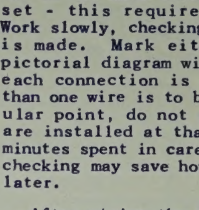
The rubber grommet may now be placed in the hole for the line cord and the cord fed through the grommet and knotted as shown in the pictorial diagram.

WIRING

Study the diagrams very carefully before wiring. Either the pictorial or schematic diagram may be followed, although the pictorial is preferred, since it shows the exact placement of wires and parts.

All connections should be securely soldered, using only rosin core solder. Acid core solder or acid flux should never be used because of the probability of corrosion. Hold the tip of the soldering iron against the wire and terminal for a few seconds before applying solder - then apply solder where tip of iron meets work. Use just enough solder to cover connections and fill the crevices between wires. Remove the iron, but do not move wires until the solder has set - this requires only a few seconds. Work slowly, checking each connection as it is made. Mark either the schematic or pictorial diagram with a colored pencil as each connection is completed. When more than one wire is to be connected to a particular point, do not solder until all wires are installed at that point. An extra few minutes spent in careful wiring and thorough checking may save hours of trouble-shooting later.

After wiring the filaments and line cord the padder condenser should be installed. This condenser is mounted directly to pin #1 on the oscillator coil and the terminal shown in the pictorial diagram. This condenser is mounted with the end which contacts the adjustment screw connected to the terminal on the tie lug. The adjustment screw of this padder should be turned out one full turn from the tight position before installation. After installation, it should be possible to adjust this condenser by means of an insulated screwdriver through the hole provided in the chassis.



Terminal numbering arrangement of the oscillator coil.

Viewed from bottom or terminal end of coil.

Fig. 1.

The black band around the paper condensers in the pictorial diagram designates the end of the condenser which is connected to the outside foil.

The balance of the wiring may be done in any order convenient for the builder.

Any type of insulated wire may be used for the antenna. To begin with, this wire should be approximately 25 feet long.

ADJUSTMENT AND OPERATION

Your phono oscillator acts as a small transmitting station which can be tuned in on your radio set. It can be adjusted to operate at any dial setting from 600 to 800 kc. To make this adjustment proceed as follows:

1. Carefully tune your receiver from 600 to 800 kc or 1200 to 1600 kc to find a dial setting where no station is heard.
2. Place the oscillator in operation by pushing the slide switch to the "on" position. Allow the unit 2 or 3 minutes to warm up.
3. Uncoil the antenna to a length of 10 feet.
4. Turn the phonograph motor on and set the pickup arm on the record. You may use a tone arm with a magnetic pickup (such as the G.E. or Pickering cartridges), or an arm with a standard crystal cartridge. Be sure to use the correct jack for the type of cartridge being used.
5. Using a small insulated screwdriver, tune the padder condenser through the opening in the chassis until record is heard in radio.
6. Tune the radio to a local station and note the volume of the music being played. If a crystal cartridge is being used and the volume of the oscillator is much lower than the radio station it will be necessary to install a 1- or 2- megohm resistor in place of the 3.3 megohm resistor designated by the white square in the diagrams. If the volume of the oscillator is much higher than the radio station and there is much distortion, increase the value of the 3.3 megohm resistor.

USING A MICROPHONE

Any type of high-impedance microphone may be used with this oscillator. However, it will be necessary to remove the equalizer circuit. This circuit is composed of the three components which have been marked with a star on the schematic and pictorial diagrams. The equalizer is needed only for a magnetic cartridge and should be entirely removed whenever a microphone or crystal cartridge is used. While any type of high impedance microphone may be used, the one listed below the parts list is particularly suited for use with this oscillator, since it is fully insulated and shielded which eliminates the danger of shock while using it.

USING A MAGNETIC PICKUP

The new-type magnetic pickups, such as those made by G.E. and Pickering, are designed to operate into a load of 5000 to 10,000 ohms. This resistor is shown connected directly across the input jack and has a value of 8200 ohms. The output of these magnetic cartridges is low. The output voltage is higher at the high frequencies than at the low frequencies. The preamplifier raises the output voltage of the magnetic cartridge to a level at least as high as that obtainable from crystal pickups. At the same time, it compensates for the higher output voltage of the cartridge at higher frequencies. The equalizing network and load resistor should be removed from the "wireless"oscillator" whenever a magnetic cartridge is not used.

USING A CRYSTAL PICKUP

When a crystal pickup is used and the equalizing components are omitted from the oscillator, a high-impedance or crystal microphone may be used. The pickup and microphone signals are then electronically mixed within the oscillator and will be heard in the radio tuned to the oscillator.

GENERAL INFORMATION

Either the padder condenser or the slug in the oscillator coil may be adjusted to change frequency. It is advisable to adjust both the padder and core to obtain best quality when the oscillator is heard in the radio. Turning either the padder or slug too far in either direction will cause the oscillator to stop oscillating.

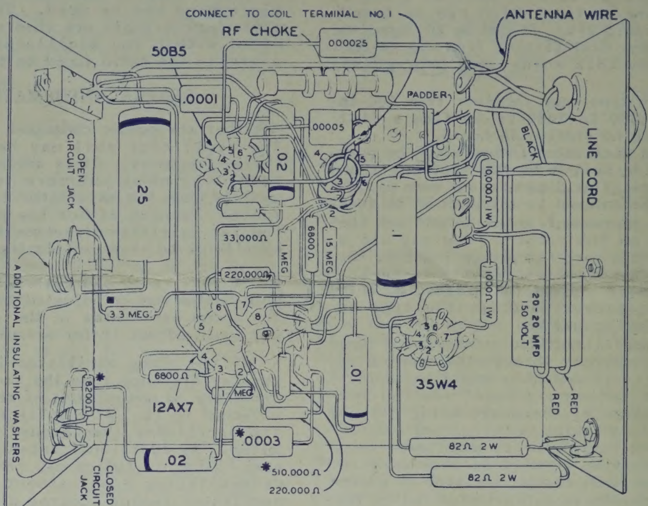
If your radio has push-button tuning, a push-button may be adjusted to the signal of the phono oscillator in the same manner as you would adjust it for a radio station.

If the phono oscillator is placed at a greater distance from the radio, it may be necessary to unwind more of the antenna wire attached to it. With sufficient antenna at the oscillator, background noise is minimized. As additional antenna is uncoiled, some change in tuning may take place, thus necessitating readjustment of the phono oscillator tuning control or of the radio. Always adjust the radio set for the maximum deflection of the tuning indicator or until the record is clearly heard and with a minimum of noise. If there is a "howl" or "whistle" in the radio while records are being played, the frequency at which the phono oscillator is "transmitting" is too close to that of a broadcast station, and it will be necessary to set the receiver dial at a different position and readjust the tuning control on the "broadcaster" for this new setting.

NOTE: If excessive hum is present in your radio when tuned to the phonograph oscillator (with no record playing), reverse the plug of the oscillator in the power outlet or socket. If hum persists, reverse power cord plugs on radio and phonograph, one at a time.

The AC-DC power supply used in this set uses one side of the power line as a common ground. This common ground is isolated from the chassis and microphone by means of the .1 mfd and .25 mfd condensers. If it is necessary to further reduce the hum present in the phono oscillator, these condensers may be shorted out. Under these conditions the one side of the power line is connected to the chassis and the microphone or phono pickup. The shielded wire connecting to either of the jacks should be fully insulated so that the shielding cannot touch any grounded object such as a water pipe or radiator. The microphone used should be fully insulated and not have a metallic case. The microphone listed below is recommended for use under these operating conditions.

CAUTION: Do not attempt any service operation until line cord plug is removed from power outlet.



PICTORIAL DIAGRAM

LIST OF MATERIAL

1 50B5 tube
1 35W4 tube
1 12AX7 tube
2 82 ohm 2 watt carbon resistor
1 1000 ohm 1 watt carbon resistor
1 10,000 ohm 1 watt carbon resistor
2 6800 ohm ½ watt carbon resistor
1 8200 ohm ½ watt carbon resistor
1 33,000 ohm ½ watt carbon resistor
2 220,000 ohm ½ watt carbon resistor
1 510,000 ohm ½ watt carbon resistor
2 1 megohm ½ watt carbon resistor
1 3.3 megohm ½ watt carbon resistor
1 15 megohm ½ watt carbon resistor
1 .000025 mfd mica condenser
1 .00005 mfd mica condenser
1 .0001 mfd mica condenser
1 .0003 mfd mica condenser
1 20-20 mfd 150 v. electrolytic condenser
1 .25 mfd paper condenser
1 .1 mfd paper condenser
2 .02 mfd paper condenser
1 .01 mfd paper condenser
1 70 to 480 mmfd padder condenser
1 14-1040 oscillator coil
2 7 pin miniature socket
1 9 pin miniature socket
1 4" x 4¾" x 2" chassis
1 slide switch
1 closed circuit jack
1 open circuit jack
1 line cord and plug
1 2½ mh RF choke
1 dual tie lug
1 5 terminal tie strip
1 standard phono plug
1 color code chart
1 instruction sheet
1 pkg. of hardware consisting of: 12 each - 4-36 x 3/16 machine screws and hex nuts; 2 each - flat and extruded fiber washers; 1 - single tie lug; 1 - 3/8" rubber grommet

83-073 COMPLETE KIT WITH TUBES **Shipping weight, 2 lbs.**

KIT ACCESSORIES

1	"Century" crystal microphone.	Shipping weight, 1 lbs.
1	Stand for microphone.	Shipping weight, 6 oz.

ALLIED RADIO CORP.

833 W. JACKSON BLVD. CHICAGO 7, ILL.

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